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BOOK OF ABSTRACTS

Aristotle Univerisity of Thessaloniki (AUTH)
Depatrment of Chemistry
Lab. of Analytical Chemistry

Tackling the challenges of monitoring dynamic systems by using flow analysis

António O. S. S. Rangel
CBQF/Escola Superior de Biotecnologia, Universidade Católica Portuguesa, Porto, Portugal
e-mail: arangel@porto.ucp.pt

Flow analysis has started as an automation tool for wet chemical assays. Its scope was further expanded to study chemical and biochemical processes. Due to its versatility and possibility for real time monitoring, it has also become a powerful tool to study dynamic systems, namely associated to environmental research or to understand biological processes. To monitor these processes, some important analytical challenges emerge: need for efficient sampling procedures; cope with a wide range of analyte concentrations; possible need for pre-concentration; minimization of interferences; search for greener chemistries; reducing sample and reagents consumption.

To tackle the above-mentioned challenges, the use of in-line separation processes like gas diffusion, dialysis, solid phase extraction (either in the reusable or renewable bead injection mode), and chromatography-like separation (use of monolithic columns), have emerged as powerful tools to both increase the selectivity and sensitivity of flow analysis methods, and yet to maintain the major advantages of its use, that is, the relative simplicity and low cost.

In this scenario, some recent contributions of the group on this line of work are discussed. Examples of the approaches used to deal with the complexity of measurements in samples of high temporal and special variability like estuarine and coastal waters will be presented, comprehending the determination of macro and micro nutrients. Strategies used to monitor processes like codfish desalting or wine analysis will also be brought to discussion.

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